An overview of sclerotinia stem rot/white mold management

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Sclerotinia stem rot

- Caused by the fungus *Sclerotinia sclerotiorum*

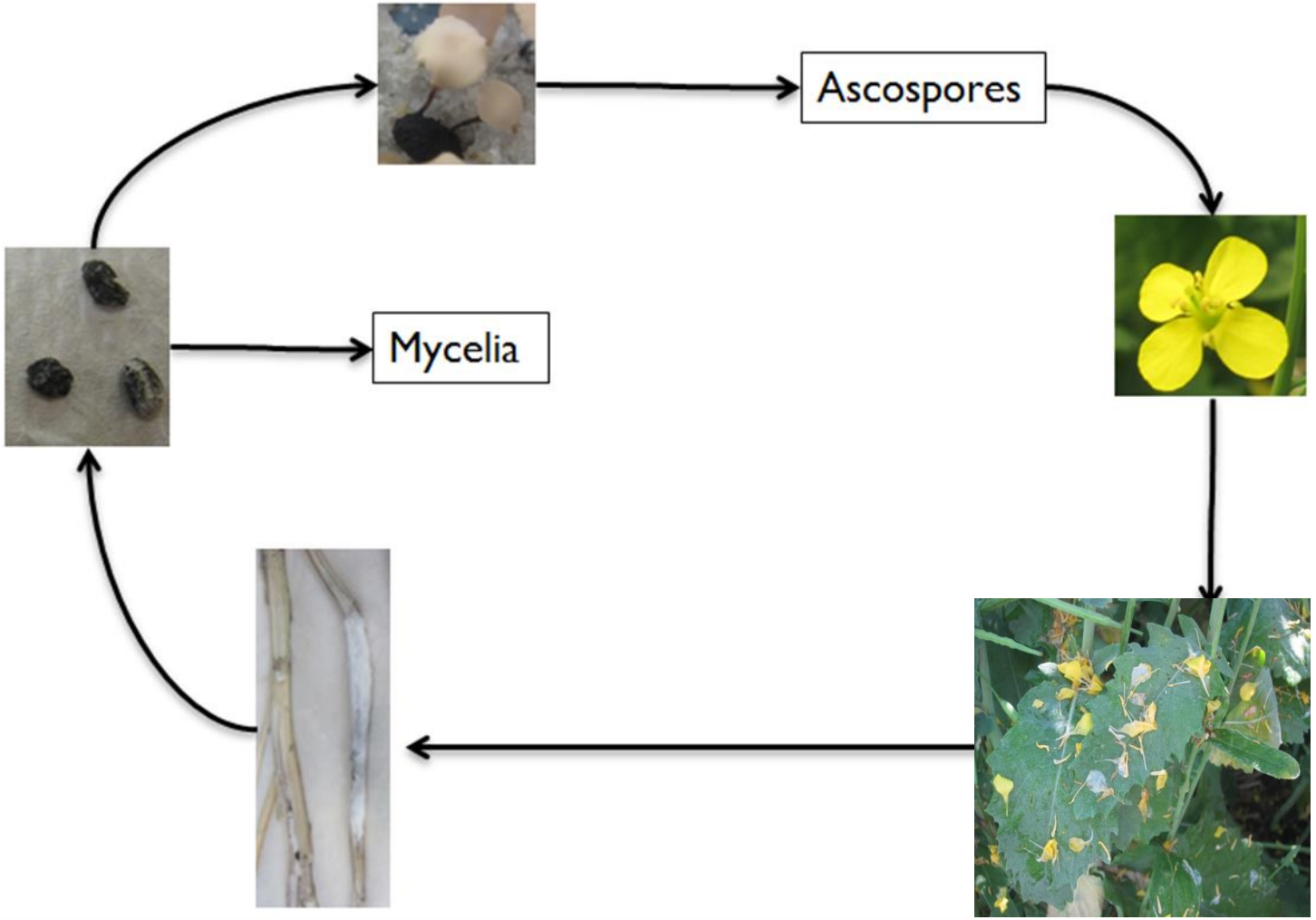
Stem rot of canola

- Can cause up to 50% yield loss

- Monocyclic disease

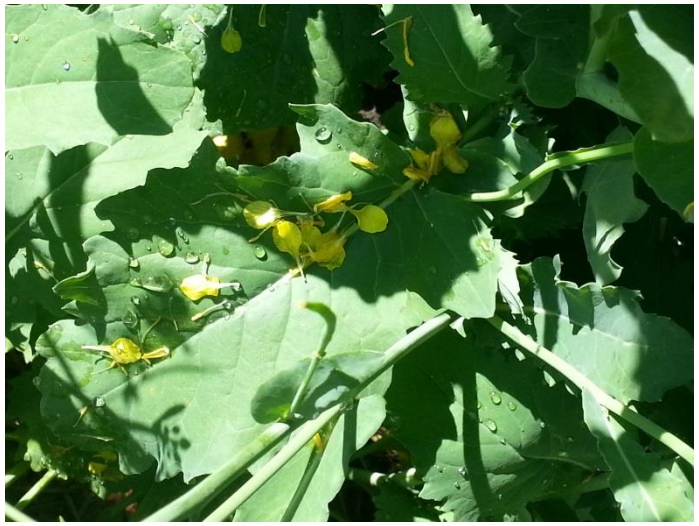
- Sporadic disease due to dependence on weather conditions

Disease cycle



Favorable conditions

- Sporadic disease
- June: rainy days to maintain soil at capacity
- Late June-July: rainy days interspersed with windy days



Management- cultural

- Crop rotation
- Tillage
- Resistance

Management - fungicide

	Fungicide group
Rovral Flow	2
Overall 240 SC	2
Quash	3
Proline	3
Lance*	7
Vertisan*	7
Priaxor	7,11
Acapela*	11
Quadris	11
Astound	9,12

Management - fungicide

- Most common management tool
- Preventative
- Apply often without any indication of disease risk

Management: bio-fungicides

- **Contans**
  - *Coniothyrium minitans*
  - Infects the sclerotia and prevents germination

- **Serenade Max/Serenade CPB**
  - *Bacillus subtilis*
  - Used as a biocide to prevent infection
  - Apply at 20-30% can apply a second time up to 50% bloom

Risk assessment

- Weather Risk Maps
- Stem Rot Checklists
- Apothecia counts

Sclerotinia Stem Rot Checklist

(For each risk factor, circle the risk points that apply to your field).

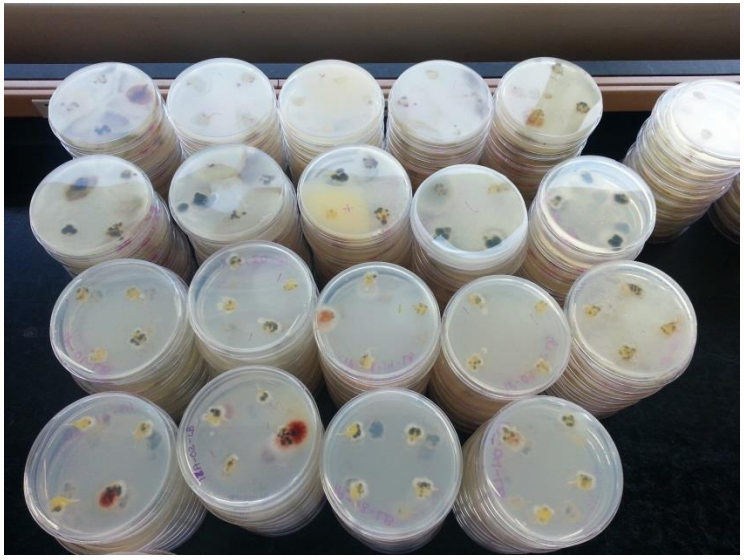
RISK FACTOR	POSSIBLE ANSWERS	RISK POINTS
NUMBER OF YEARS SINCE LAST CANOLA CROP	More than six years	0
	Three to six years	5
	One to two years	10
DISEASE INCIDENCE IN LAST HOST CROP	None	0
	Low (1 to 10%)	5
	Moderate (11 to 30%)	10
	High (31 to 100%)	15
CROP DENSITY	Low	0
	Normal	5
	High	10
RAIN IN THE LAST TWO WEEKS	Less than 10 mm (0.4")	0
	10 to 30 mm (0.4 to 1.2")	5
	More than 30 mm (1.2")	10
WEATHER FORECAST	High pressure	0
	Variable	10
	Low pressure	15
REGIONAL RISK FOR APOTHECIA DEVELOPMENT	None found	0
	Low numbers	10
	High numbers	15

TOTAL RISK POINTS FOR ALL RISK FACTORS =

Risk assessment – petal test

- Commercially available in 1991

- Based on the positive statistical relationship between petal infestation and stem rot incidence



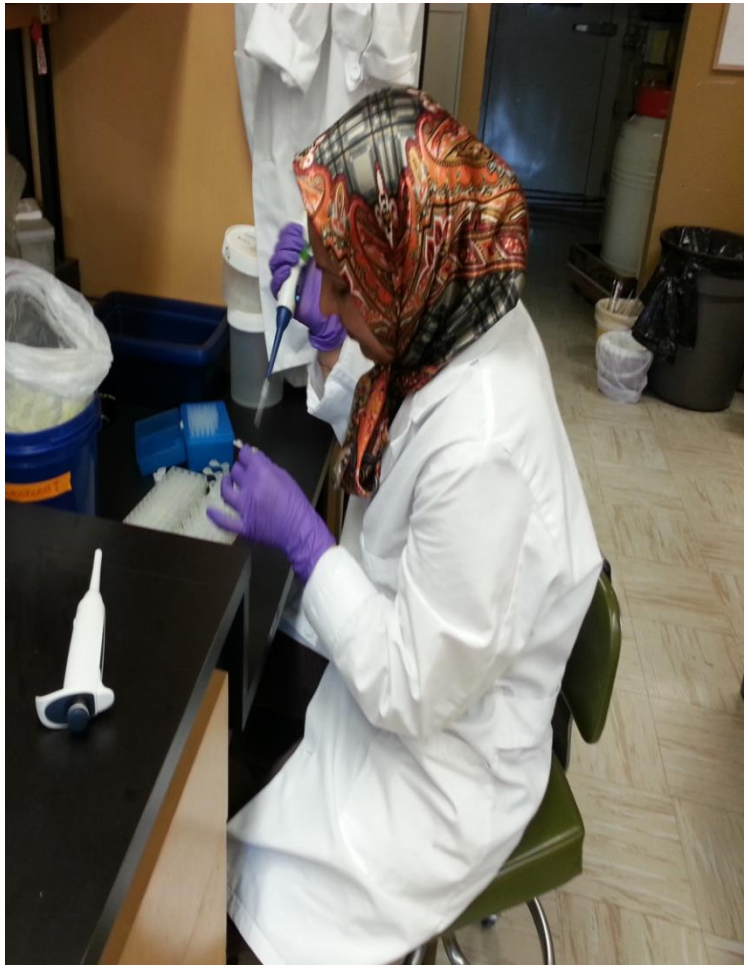
New research

1. Quantitative (q)PCR based petal test

2. Sclerotinia depots

qPCR petal test

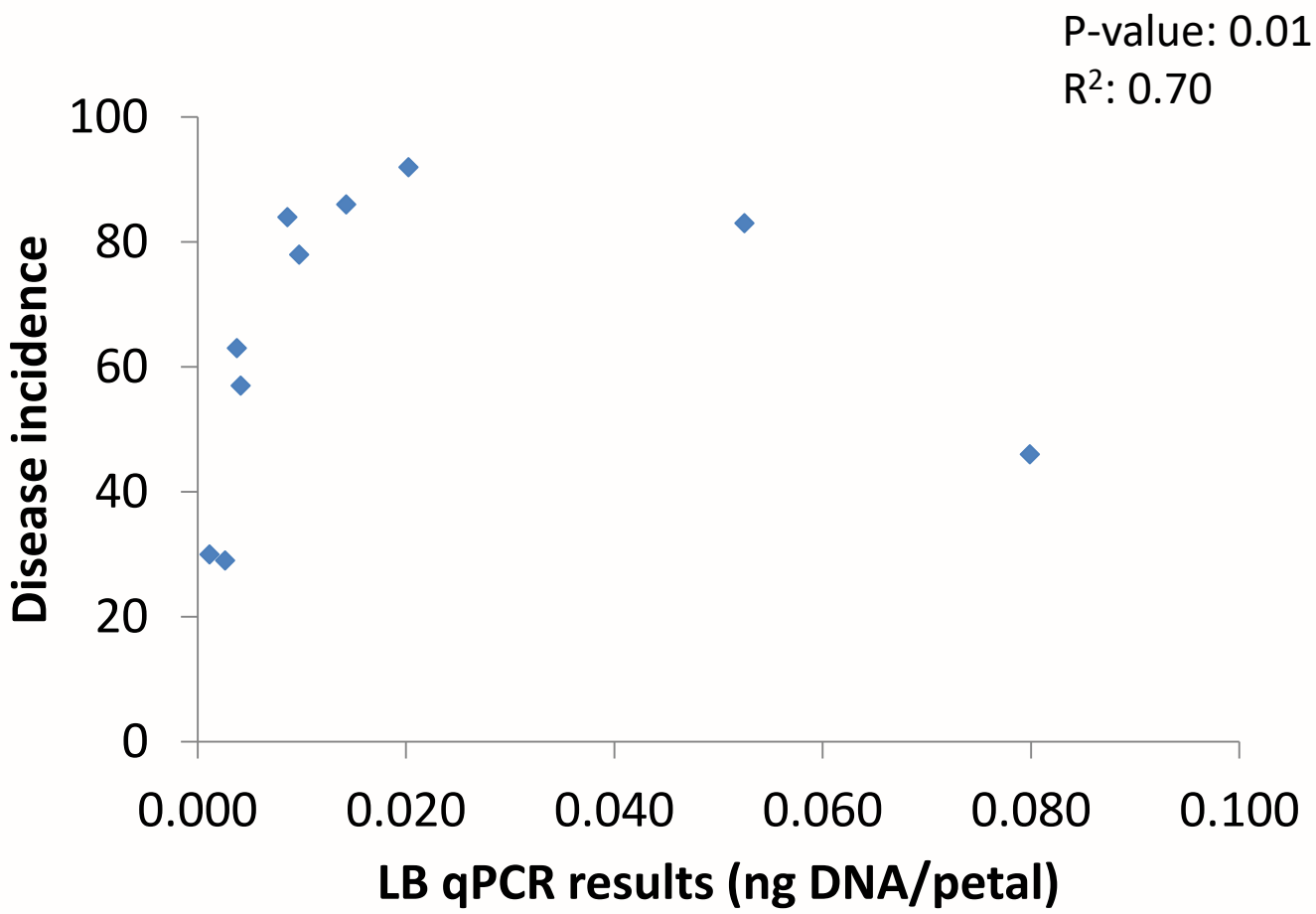
- Faster results than the traditional petal test
- Less risk for misidentification
- Quantifies the amount of *S. sclerotiorum* DNA on field collected petals



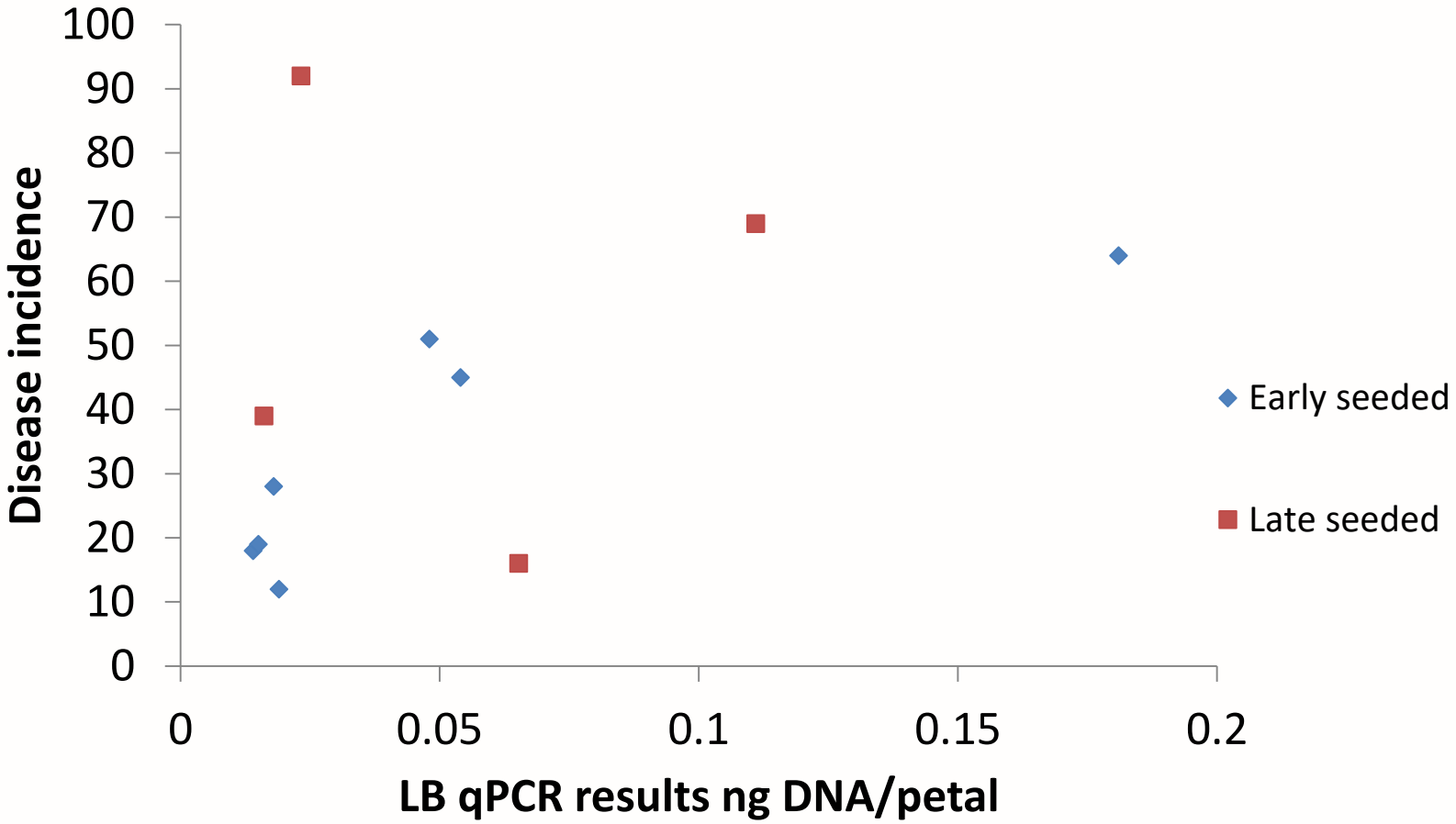
Field collection

- Commercial canola fields
- Various bloom stages
- Within a fungicide free check-strip

Statistical relationship

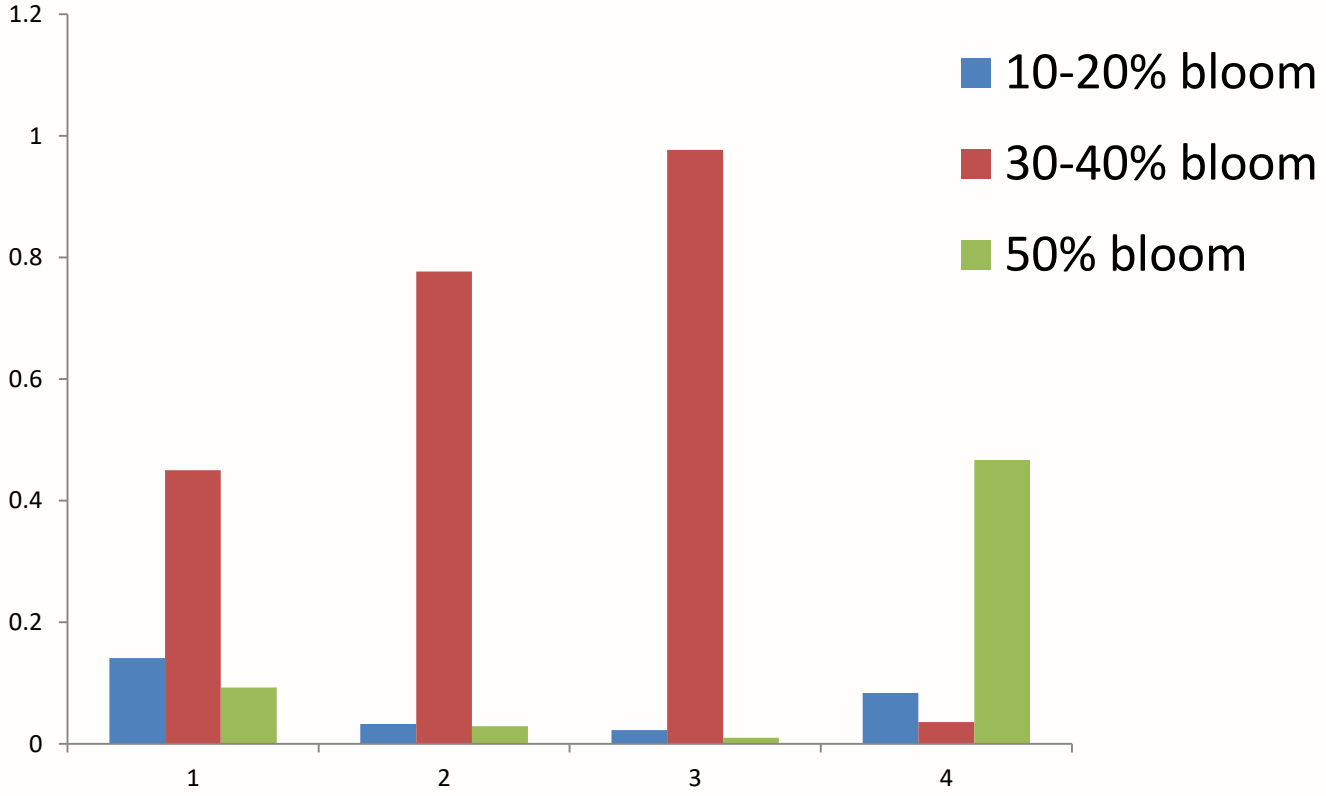


Risk assessment - qPCR



Monitoring inoculum

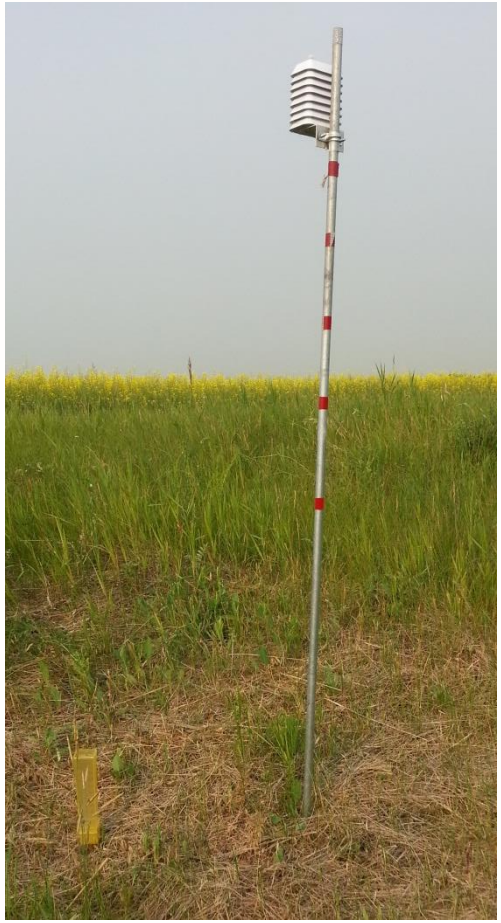
- Could be used to determine when to best spray



Key findings

- There is a potential for using as the basis for a risk assessment tool

- To be able to set thresholds need to find a way to account for year to year variations



Sclerotinia depots

- Developed by Lone Buchwaldt
- Sclerotinia depots@agr.gc.ca
- Monitor sclerotia germination

Sclerotinia depots

- Can be used with the stem rot checklist

For each risk factor, select the risk points that apply to your field

Risk factor	Possible answers	Risk points
NUMBER OF YEARS SINCE LAST CANOLA CROP	More than six years Three to six years One to two years	0 5 10
DISEASE INCIDENCE IN LAST HOST CROP	None Low (1 to 10%) Moderate (11 to 30%) High (31 to 100%)	0 5 10 15
CROP DENSITY	Low Normal High	0 5 10
RAIN IN THE LAST TWO WEEKS	Less than 10 mm (0.4") 10 to 30 mm (0.4 to 1.2") More than 30 mm (1.2")	0 5 10
WEATHER FORECAST	High pressure Variable Low pressure	0 5 10
PERCENT SCLEROTIA GERMINATION IN A LOCAL DEPOT	0 to 5% 6 to 25% 26 to 50% 51 to 100%	0 5 10 15
TOTAL RISK POINTS FOR ALL RISK FACTORS =		

Reset Form

Borage and Hemp

Photo courtesy of Carl Lynn

Photo courtesy of Dale Risula

Borage

- Sclerotinia is a very large concern
- No resistant varieties
- Main approach is rotation and field selection

Borage

- Fungicides:
  - Proline 480 SC is registered
  - Very long flowering window
  - May also get infection at the base of the plant

Photo courtesy of Carl Lynn

Hemp

- Very susceptible and can cause major yield losses
- Mycelial infection may play an important role

Photo courtesy of Kevin Freisen

Hemp

- No registered fungicides
- No genetic resistance
- Crop rotation of at least 5 years

Hemp

- Seed later
- Use a moderate seeding rate
- Wider row spacing
  - Pseudo row cropping

Hemp

- Irrigation:
  - Irrigate well
  - Let the soil dry in between irrigation events

- Breeding:
  - Shorter plants
  - Earlier maturing

General summary

- Sclerotinia management is complicated and will very with the host
- For canola there are risk assessment tools available and new ones being researched
- For other hosts management will be based on cultural strategies


Questions?